

What is claimed is:

1. A method of packaging a sensor comprising a flexural resonator, the method comprising:
  - affixing a flexural resonator, having an exposed sensing surface, to a platform, wherein a spaced relationship is created between the exposed sensing surface and the platform so that the exposed sensing surface of the flexural resonator can displace a fluid in contact therewith;
  - affixing an application specific integrated circuit (ASIC) to the platform, providing electrical communication between ASIC and the flexural resonator for providing stimulus to the flexural resonator and for receiving a response signal from the flexural resonator;
  - affixing a secondary component positioned independently from the ASIC on the platform, the secondary component being selected from a temperature sensor, a field programmable gate array, a calibration unit, a conductive path, a resistor, a capacitor, an amplifier, a filter, and combinations of two or more thereof, and optionally providing electrical communication between the ASIC and the secondary component.
2. The method of claim 1, further including applying a protective layer covering the platform and the flexural resonator while maintaining the exposed sensing surface such that the exposed sensing surface can displace the fluid in contact therewith.
3. The method of claim 2, wherein the protective layer is selectively applied by spraying, brushing, over molding, laminating or by combinations thereof.
4. The method according to any of claims 2 or 3, further including blocking the exposed sensing surface with a removable protective barrier prior to applying the protective layer.

5. The method according to any of claims 2-4, wherein the removable protective barrier is a reusable or consumable barrier.
6. The method according to claim 5, wherein the removable protective barrier is a consumable barrier that comprises a polymer, starch, wax, salt or other dissolvable crystal, low melting point metal, a photoresist, or another sacrificial material.
7. The method according to claim 5 wherein the removable protective barrier is a reusable barrier that comprises a relatively soft material that will not plastically deform the flexural resonator if it contacts the flexural resonator.
8. The method according to any of claims 1-7, further including at least partially protecting the flexural resonator from the ambient or operational conditions through the use of a housing.
9. The method according to any of claims 1-8, further comprising operating the flexural resonator at temperatures between about  $-60^{\circ}\text{C}$  and about  $300^{\circ}\text{C}$ .
10. The method according to any of claims 1-8, further comprising operating the flexural resonator at temperatures between about  $-40^{\circ}\text{C}$  and about  $170^{\circ}\text{C}$ .
11. The method according to any of claims 1-10, wherein the flexural resonator affixed to the platform has a length or width smaller than about 5 mm.
12. The method according to any of claims 1-10, wherein the flexural resonator affixed to the platform has a length or width smaller than about 1 mm.
13. The method according to any of claims 1-12, wherein the package has a volume of about less than about  $15\text{ cm}^3$ .
14. The method according to any of claims 1-12, wherein the package has a volume of about less than about  $10\text{ cm}^3$ .

15. The method according to any of claims 1-14, wherein the package has a footprint of about less than about 40 cm<sup>2</sup>.
16. The method according to any of claims 1-14, wherein the package has a footprint of about less than about 20 cm<sup>2</sup>.
17. The method according to any of claims 1-16, further comprising at least partially preserving electrical characteristics of the flexural resonator through the use of a Faraday cage.
18. The method according to any of claim 1-17, further comprising placing the package in an engine, a transmission, a transfer case, a differential, a brake system, a steering system, an antifreeze system, a heating and cooling system, a washer system, or combinations thereof.
19. The method according to any of claims 1-18, further comprising placing the package in a lubricant, a brake fluids, a steering fluid, an antifreeze fluid, a refrigerant fluid, a washer fluid, or combinations thereof.
20. A package for protecting a sensor comprising a flexural resonator, the package comprising:
  - a flexural resonator on a platform, the flexural resonator having one or more exposed sensing surfaces in spaced relationship to the platform so that the exposed sensing surface can displace a fluid in contact therewith to determine one or more characteristics of the fluid,
  - an application specific integrated circuit (ASIC) on the platform, the ASIC being in electrical communication with the flexural resonator for providing stimulus to the flexural resonator and for receiving a response signal from the flexural resonator, and
  - a secondary component positioned independently from the ASIC on the platform, the secondary component being selected from the group a temperature sensor, a field programmable gate array, a calibration unit, a conductive path, a

resistor, a capacitor, an amplifier, a filter, and combinations of two or more thereof, the secondary component being in optional electrical communication with the ASIC.

21. The package of claim 20, further comprising a housing spaced from the exposed sensing surface.

22. The package of claims 21 wherein the housing includes a plurality of walls that substantially surround the flexural resonator while maintaining exposure of the exposed sensing surface to the fluid.

23. The package according to any of claims 20-22 wherein the ASIC comprises a temperature sensor, or wherein the secondary component comprises a temperature sensor.

24. The package according to any of claims 20-23 further comprising a protective layer covering the flexural resonator and the platform while maintaining the exposed sensing surface such that the exposed sensing surface can displace the fluid in contact therewith.

25. The package according to any of claim 24 wherein the protective layer covers, partially or completely, the ASIC or the secondary component.

26. The package according to any of claims 20-25 wherein the flexural resonator is capable of operating at temperatures between  $-60^{\circ}\text{C}$  and  $300^{\circ}\text{C}$ .

27. The package according to any of claims 20-25 wherein the flexural resonator is capable of operating at temperatures between  $-40^{\circ}\text{C}$  and  $170^{\circ}\text{C}$ .

28. The package according to any of claims 20-27 wherein the flexural resonator on the platform has a length or width smaller than 5 mm.

29. The package according to any of claims 20-27 wherein the flexural resonator on the platform has a length or width smaller than 1 mm.

30. The package according to any of claims 20-29 wherein the package has a volume of about less than  $15 \text{ cm}^3$ .
31. The package according to any of claims 20-29 wherein the package has a volume of about less than about  $10 \text{ cm}^3$ .
32. The package according to any of claims 20-31 wherein the package has a footprint of less than about  $40 \text{ cm}^2$ .
33. The package according to any of claims 20-31, wherein the package has a footprint of about less than about  $20 \text{ cm}^2$ .
34. The package according to any of claims 20-33 wherein the flexural resonator is selected from tuning forks, cantilevers, bimorphs, or unimorphs, membrane resonators, or torsional resonators.
35. The package according to any of claims 20-34 wherein in the package is adapted for use in engines, automobiles, heavy machinery, military equipment, airplane parts, oil drilling, exploration and production well logging, oil refining, pipeline and quality control equipment, marine transportation, or sub-sea exploration and aerospace related equipment.
36. The package according to any of claims 20-35 further comprising a Faraday cage.
37. The package according to any of claims 20-36 wherein the package is adapted for use in an engine, a transmission, a transfer case, a differential, a brake system, a steering system, an antifreeze system, a heating and cooling system, and a washer system.

38. The package according to any of claims 20-37 wherein the package is adapted for use in lubricants, brake fluids, steering fluids, antifreeze fluids, refrigerant fluids, and washer fluids.
39. The package according to any of claims 20-38 wherein the flexural resonator is a tuning fork.
40. The method according to any of claims 1-19 wherein the flexural resonator is a tuning fork.